



Space Policy
INTA 3043/8803

3.0 Credits
Spring 2019
Tuesday and Thursday, 9:30am-10:45am
Skiles 268

Prof. Mariel Borowitz, mariel.borowitz@inta.gatech.edu
318 Habersham, 404-385-1494
Office Hours: Tuesday 10:45am-11:45am or by appointment

Course Description:

Space technologies permeate many aspects of our lives, from the GPS applications in our phones to satellite remote sensing that underlies international security verification. We hear about experiments done at the International Space Station or see images taken by the Hubble Space Telescope. But how do policy-makers decide what new space missions to fund, where to focus exploration, and what industry developments to allow or encourage?

The answers to these questions require not only examining national policy-making processes, but also the challenges posed by the international nature of space activities. Like the oceans and atmosphere, space is a region not owned by any one nation. This means that ensuring long-term sustainability of space activities can be very challenging, and requires international cooperation.

The unique nature of space also poses numerous opportunities for nations to benefit from working together. Orbital mechanics dictates that satellites in orbit around the Earth pass over a variety of nations, which means that the data they collect or the services they provide are relevant to many nations. In many cases, countries can benefit significantly if these systems – meteorological, remote sensing, precision navigation and timing, communications, etc. – can be developed and operated cooperatively, avoiding the need for nations to develop expensive redundant systems. Beyond Earth orbit, all peoples on Earth have an interest in understanding the mysteries of the universe uncovered by space science and exploration. Given the often-high costs of space systems, international cooperation may represent the only way for nations to pursue some space activities.

In this course, we will examine a range of current international space policy issues, including civil, military, and commercial activities. We will look at the origins and evolution of space policy over time and examine its strategic role in international affairs. The course will introduce students to a range of current challenges and debates in space policy, such as current international human exploration strategies, technical and political problems and potential solutions related to space debris, efforts at international cooperation in satellite Earth observations, and recent developments and possibilities in the commercial space launch sector.

This course will expose students to the debates and decisions that have shaped global space activities, and the international policy issues that must be addressed to meet future goals.

Course Objectives:

- Student will demonstrate the ability to describe the social, political, and economic forces that influence social behavior.
- Student will demonstrate the ability to describe the social, political, and economic forces that influence the global system
- Students will demonstrate the ability to describe the causal and determinant relationships between science and technology (S&T) and international affairs across different topic areas.
- Students will be able to express their arguments clearly and effectively both in written reports and in their research and oral presentations.
- Students will be able to work in small groups in a way that demonstrates respect for their colleagues and efficiency in working collaboratively towards projects and goals.
- Students will be able to identify a variety of space policy issues and develop arguments for and against particular policy options
- Students will demonstrate the ability to analyze an international space policy issue in depth, acknowledging the role of both science and technology and international affairs in identifying and choosing among policy options.

Course Texts:

Required:

Simpson, Michael et al. *Handbook for New Actors in Space*. Secure World Foundation, 2017.
*Note that a digital version of this text can be downloaded for free through the Secure World website.

Weir, Andy. *The Martian: A Novel*. Broadway Books, 2014.

The majority of the readings for this course will be journal articles, government and industry reports, and newspaper articles. These additional readings will be listed on T-Square at least one week in advance of the class for which they should be read, and can be found online through the Georgia Tech library.

Suggested:

These texts provide useful background information related to the lecture material

Burrows, William E. *This New Ocean: The Story of the First Space Age*. New York: Modern Library, 1999.

Moltz, James Clay. *Crowded Orbits: Conflict and Cooperation in Space*. Columbia University Press, 2014.

Grade Distribution

- *14% Class Participation*
- *36% Weekly One-Page Policy Memos*
 - *12 Policy Memos worth 3% each*
- *20% Midterm Project*
 - *Individual Paper (5%), Group Presentation (15%)*
- *30% Final Paper*
 - *Main Paper (25%) and Policy Memo (5%)*

Assignments

14% Class Participation (not just attendance!)

This course will include discussion on a regular basis, drawing upon the readings and lecture material. The value of these discussions is entirely dependent on the preparation and engagement of the students in the class. To get full credit for class participation, you must, on a consistent basis, attend class, be prepared for discussion, and engage fully with your classmates.

36% Weekly One-Page Policy Memos (12 worth 3% each)

Along with each week's readings, you will receive a policy question to be addressed in a one-page (250-500 word) policy memo, due at the start of class on Thursday. The policy memo should provide your analysis of the issue based on the readings and lecture for that week. Policy memos are graded on both substance and style. You should demonstrate your understanding of the issue, providing sufficient evidence and explanation to support your answer. Sources (primarily the assigned readings) should be referenced and properly cited. It is also important to answer the question clearly and succinctly, using a logical organization and flow.

You can think of the policy memo as the type of short, formal document you might provide to a supervisor in response to an email inquiry. Despite the fact that it is short (and often produced relatively quickly), it must be clear, concise, and accurate. In some cases, you will need to provide some interpretation of the question or explicitly state your assumptions in providing an answer. Style may vary, and you may choose to use headings, subheadings, or even bullet points, in cases where they will be effective. Writing a very good one-page memo can be more difficult than writing a much longer paper. However, this is one of the most important and practical types of writing to master.

20% Midterm Project – Due Tuesday, February 23, 2016 at 1:05pm

Individual Paper (5%), Group Presentation (15%)

The midterm project will be focused on the future of human space exploration, and will consist of two components: a 10-minute group presentation, and a 1-page (250-500 word) individual paper from each group member. As part of this assignment, each individual in the class will be assigned a country and a group. You will be required to research your assigned country's human spaceflight policies, looking at past activities, current capabilities, policy statements, future plans, and other relevant information. You should also make use of assigned course readings, lecture materials, and other resources provided.

Groups will be assigned so that each group has a representative from each major spacefaring country or region. Within your group, you will be required to develop a plan for the future of

human space exploration over the next 20 to 25 years. The plan may be fully cooperative (involving all countries in the group), completely independent (consisting of uncoordinated national activities), or somewhere in the middle (collaborative/ synergistic activities, multiple bilateral or small group cooperative agreements, etc.). The proposed solution should be realistic, taking into account cost and technical complexity as well as national and international political goals and challenges.

The group presentation should outline the proposed human space exploration plan, explaining the strategy (destination based, technology based, etc.) and schedule. It should address the strengths and benefits of the proposal, as well as the potential weaknesses and (to the extent possible) costs. The paper should explain the reasoning behind the proposal: why was this solution chosen, and why do the nations expect it to be successful. (You may also choose to discuss which alternatives were considered and why the proposed solution is preferable.)

Each individual in the group will also write a country position paper (individual paper). In this document, you should explain your nation's role in the proposed future space exploration. You should discuss how the proposed solution fits within your nation's human spaceflight objectives (based on past activities, current capabilities, policy statements, state future plans, etc.).

30% Final Paper (25%) and Policy Memo (5%) – Due Friday, December 5, 2014 at 1:05pm

The final research paper should be 10 pages (2,500-5,000 words) [Length requirement is doubled for graduate students], written on a space policy issue of your choice. You can choose from the topics that we cover in lecture, but you are not restricted to these topics. The paper should clearly identify a policy research question and provide background information with regard to the issue, including the key policy goals, stakeholders, and technical or political challenges involved, making clear its relevance to international affairs. Students should conduct a literature review and discuss the relation of their paper to existing work. A methodology section should lay out their criteria for assessment (operationalization of the research question) and planned methods for answering the research question. The data and analysis sections should carry out this plan using appropriate qualitative and/or quantitative methods. Each paper should end with a discussion/ conclusion section that discusses the results of the analysis and provides concrete policy recommendations.

In addition to the final paper, you should write a 1-page (250-500 word) policy memo summarizing the most important findings from your paper. Assume you are writing the memo to a high-level government official that is not familiar with the specifics of the issue you've chosen. Include relevant background on the issue as well as your recommendations for policy action.

Turning in Written Assignments

All written assignments should be turned in electronically on Canvas (not printed). Please use the following format to name the document:

For undergrads: INTA3043_AssignmentName_YourFirstNameYourLastName

For grad students: INTA8803_AssignmentName_YourFirstNameYourLastName

General Guidance for Written Assignments

These are the main questions I'll be asking when grading written assignments:

- Did you understand the material presented in lecture and readings?
- Do you bring in sufficient evidence (and sources) to fully answer the question?
- Is your paper accurate? (Do you use the correct evidence and use evidence correctly?)
- Are your sources correctly cited?

Is your paper clear and well-written?

- Do I know what your answer is (bottom line up front!)?
- Is it clear how your sub-arguments/ evidence support your thesis?
 - Not just giving data, but explaining why it's important
 - Not going off on tangents, not including information that isn't relevant
- Does the argument have a logical flow (create an outline!)
- Is the paper free of grammar mistakes or other stylistic issues?

Class Schedule:

Week	Dates	Topic	Assignments Due
1	Jan. 8, 10	Space Policy Today	
2	Jan. 15, 17	Global Space Launch Industry	Policy Memo 1
3	Jan. 22, 24	New Space	Policy Memo 2
4	Jan. 29, 31	Human Space Exploration: The Space Race <i>Midterm Project Groups Assigned</i>	Policy Memo 3
5	Feb. 5, 7	Human Space Exploration Post-Apollo	Policy Memo 4
6	Feb. 12, 14	Future of Human Space Exploration	Policy Memo 5
7	Feb. 19, 21	Midterm Project Presentations	Midterm Project/ Paper
8	Feb. 26, 28	Space Science	Policy Memo 6
9	March 5, 7	Earth Science Satellites	Policy Memo 7
10	March 12, 14	Satellite Data Sharing Issues	Policy Memo 8
11	March 19, 21	<i>Spring Break</i>	
12	March 26, 28	Global Navigation Satellite Systems	Policy Memo 9
13	April 2, 4	Communications Satellites	Policy Memo 10
14	April 9, 11	Space Security Challenges	Policy Memo 11
15	April 16, 18	Space Traffic Management	Policy Memo 12
16	April 23	Presentations and Discussion	Final Paper Due